

ally on the subject on his third voyage, saying, "the waters move with the heavens (*con los cielos*) from east to west." Even the direction of separate floating masses of sea weed confirmed this view.* A small pan of tinned iron, which he found in the hands of the natives of the island of Guadaloupe, confirmed Columbus in the idea that it might be of European origin and obtained from the remains of a shipwrecked vessel, borne by the equatorial current from Spain to the coasts of America. In his geognostic fancies, he regarded the existence of the series of the smaller Antilles and the peculiar configuration of the larger islands, or, in other words, the correspondence in the direction of their coasts with that of their parallels of latitude, as the long-continued action of the movement of the sea between the tropics from east to west.

When the admiral, on his fourth and last voyage, discovered the inclination from north to south of the coasts of the continent from Cape Gracias á Dios to the Laguna de Chiriqui, he felt the action of the violent current which runs N. and N.N.W., and is induced by the contact of the equatorial current with the opposite dike-like projecting coast-line. An-

* The great attention paid by the early navigators to natural phenomena may be seen in the oldest Spanish accounts. Diego de Lepe, for instance, found, in 1499 (as we learn from a witness in the lawsuit against the heirs of Columbus), by means of a vessel having valves, which did not open until it had reached the bottom, that at a distance from the mouth of the Orinoco, a stratum of fresh water of six fathoms depth flowed above the salt water (Navarrete, *Viages y Descubrim.*, t. iii., p. 549). Columbus drew milk-white sea water ("white as if meal had been mixed with it") on the south coast of Cuba, and carried it to Spain in bottles (*Vida del Almirante*, p. 56). I have myself been at the same spots for the purpose of determining longitudes, and it surprised me to think that the milk-white color of sea water, so common on shoals, should have been regarded by the experienced admiral as a new and unexpected phenomenon. With reference to the Gulf Stream itself, which must be regarded as an important cosmical phenomenon, many effects had been observed long before the discovery of America, produced by the sea washing on shore at the Canaries and the Azores stems of bamboos, trunks of pines, corpses of strange aspect from the Antilles, and even living men in canoes "which could never sink." These effects were, however, then attributed solely to the strength of the westerly gales (*Vida del Almirante*, cap. 8; Herrera, Dec. i., lib. i., cap. 2; lib. ix., cap. 12), while the movement of the waters, which is wholly independent of the direction of the winds—the returning stream of the oceanic current, which brings every year tropical fruits from the West Indian Islands to the coasts of Ireland and Norway, was not accurately recognized. Compare the memoir of Sir Humphrey Gilbert, *On the Possibility of a Northwest Passage to Cathay*, in Hakluyt, *Navigations and Voyages*, vol. iii., p. 14; Herrera, Dec. i., lib. ix., cap. 12; and *Examen Crit.* t. ii., p. 247-257; t. iii., p. 99-108